

What is claimed is:

[Claim 1] Intrinsic gauging assembly for a ferrule type tube fitting, comprising:

a coupling body having a threaded end and at least one ferrule contained therein;

a threaded coupling nut that mates with said threaded end of the coupling body;

a visually perceptible marking on the threaded coupling nut body that is visible when the fitting is in a finger tight condition, and that is substantially imperceptible after the fitting has been assembled on a tube end to an initial pull-up position.

[Claim 2] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is knurling.

[Claim 3] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is a colored region.

[Claim 4] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is a colored band.

[Claim 5] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is a ring.

[Claim 6] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is one or more etchings.

[Claim 7] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is a groove.

[Claim 8] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is a recess.

[Claim 9] The intrinsic gauging assembly of claim 1, wherein said visually perceptible marking is on a neck portion of said coupling nut.

[Claim 10] The intrinsic gauging assembly of claim 1, wherein a portion of the coupling body is work hardened.

[Claim 11] Intrinsic gauging for a ferrule type tube fitting, comprising
a coupling body having a threaded end;
a threaded coupling nut that mates with said threaded end of the coupling body;
at least one ferrule retained in the coupling body interior; and
a visually perceptible marking on the coupling nut; wherein said marking includes a first demarcation and a second demarcation; wherein said first demarcation corresponds to an initial pull-up position and said second demarcation corresponds to a maximum pull-up position.

[Claim 12] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is knurling.

[Claim 13] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is a colored region.

[Claim 14] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is a colored band.

[Claim 15] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is a ring.

[Claim 16] The intrinsic gauging assembly of claim 11, wherein said first demarcation and said second demarcation are etchings.

[Claim 17] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is a groove.

[Claim 18] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is a recess.

[Claim 19] The intrinsic gauging assembly of claim 11, wherein said visually perceptible marking is on a neck portion of said coupling nut.

[Claim 20] The intrinsic gauging assembly of claim 1, wherein a portion of the coupling body is work hardened.

[Claim 21] The intrinsic gauging assembly of claim 11 further comprising a third demarcation that is visible when the fitting is in a finger tight condition and generally imperceptible when the fitting is in an initial pulled-up position.

[Claim 22] The intrinsic gauging assembly of claim 11, wherein a portion of the coupling body is work hardened.

[Claim 23] Intrinsic gauging assembly for a ferrule type tube fitting, comprising:

a coupling body having a threaded end and at least one ferrule contained therein;

a threaded stud member having a threaded portion that mates with said threaded end of the coupling body;

intrinsic gauging means located on said threaded stud member, wherein said intrinsic gauging means indicates when said threaded stud member is properly pulled-up.

[Claim 24] The intrinsic gauging assembly of claim 23, wherein said intrinsic gauging means includes an end of said threaded portion of said threaded stud member and an end of the threaded stud member, wherein said end of said threaded portion of said threaded stud member and said end of said threaded stud member have an axial length therebetween, said length providing information regarding the pull-up of the assembly.

[Claim 25] The intrinsic gauging assembly of claim 24, wherein the threaded stud member is in a finger tight position when said end of said threaded portion of said threaded stud member aligns with a front face of said coupling body and is in a pull-up position when said end of said threaded stud member aligns with said front face of said coupling member.

[Claim 26] The intrinsic gauging assembly of claim 24, wherein the threaded stud member is in an initial pull-up position when said end of said threaded portion of said threaded stud member aligns with a front face of said coupling

body and is in a maximum pull-up position when said end of said threaded stud member aligns with said front face of said coupling member.

[Claim 27] The intrinsic gauging assembly of claim 23 further comprising a marking, wherein said end of said threaded portion of said threaded stud member, said end of said threaded stud member, and said marking each denote a pull-up position of said assembly.

[Claim 28] The intrinsic gauging assembly of claim 23, wherein a portion of the coupling body is work hardened.

[Claim 29] The intrinsic gauging assembly of claim 23 further comprising a tool for tightening said threaded stud member.

[Claim 30] Intrinsic gauging assembly for a ferrule type tube fitting, comprising:

- (a) a coupling body having a threaded end and at least one ferrule contained therein;
- (b) a threaded coupling nut that mates with said threaded end of the coupling body; and
- (c) at least three marking indicating a pull-up position:
 - (i) a first marking indicating a finger-tight position;
 - (ii) a second marking indicating an initial pull-up position; and
 - (iii) a third marking indicating a maximum pull up position.

[Claim 31] The intrinsic gauging assembly of claim 30 further comprising an axial length between said first and second marking, wherein said axial length is substantially imperceptible when said assembly is in the initial pull-up position.

[Claim 32] Intrinsic gauging assembly for a ferrule type tube fitting, comprising:

a coupling body having a threaded end that is capable of receiving a tube end;
a threaded coupling nut that mates with said threaded end of the coupling body;

at least one ferrule retained in the nut interior; and
a visually perceptible marking on the coupling body that is visible when the fitting is in a finger tight condition, and that is substantially imperceptible after the fitting has been assembled on a tube end to an initial pull-up position, wherein the visually perceptible marking comprises a lubricant.

[Claim 33] The assembly of claim 32 wherein said marking further comprises a machined surface on the coupling body.

[Claim 34] The assembly of claim 32 wherein marking further comprises a band having a predetermined axial length.

[Claim 35] The assembly of claim 32 wherein said lubricant comprises a thread lubricant.

[Claim 36] The assembly of claim 32 wherein said lubricant has a perceptible color.

[Claim 37] The assembly of claim 32 wherein said lubricant is tungsten or molybdenum disulfide.

[Claim 38] A method for gauging proper pull-up of a coupling nut on a coupling body in a ferrule type fitting, comprising the steps of:

- a. forming a visually perceptible marking on the coupling body, wherein said marking comprises a lubricant applied to a set of threads associated with the coupling body;
- b. said forming step comprising applying the marking to correspond to a predetermined axial displacement of the coupling nut relative to the coupling body for initial pull-up; and
- c. assembling the coupling nut onto the coupling body until the marking is substantially covered by said coupling nut.

[Claim 39] Intrinsic gauging for a tube fitting of the type having a body, a nut threadably coupled to the body and at least one ferrule, comprising:
a first marking on the body and a second marking on the nut, said first and second markings being aligned when the fitting is in a finger tight condition,

said markings being unaligned as the fitting is pulled up, and said markings being aligned again when the fitting is fully made up.

[Claim 40] The assembly of claim 39 wherein said first and second markings are laser etched.

[Claim 41] The assembly of claim 39 further comprising a third marking on the body, wherein said third marking aligns with the marking on the nut when the axial displacement of the nut relative to the body has reached a predetermined maximum.

[Claim 42] The assembly of claim 39 further comprising a third marking on the nut, where said third marking aligns with the marking on the nut when the axial displacement of the nut relative to the body has reached a predetermined maximum.